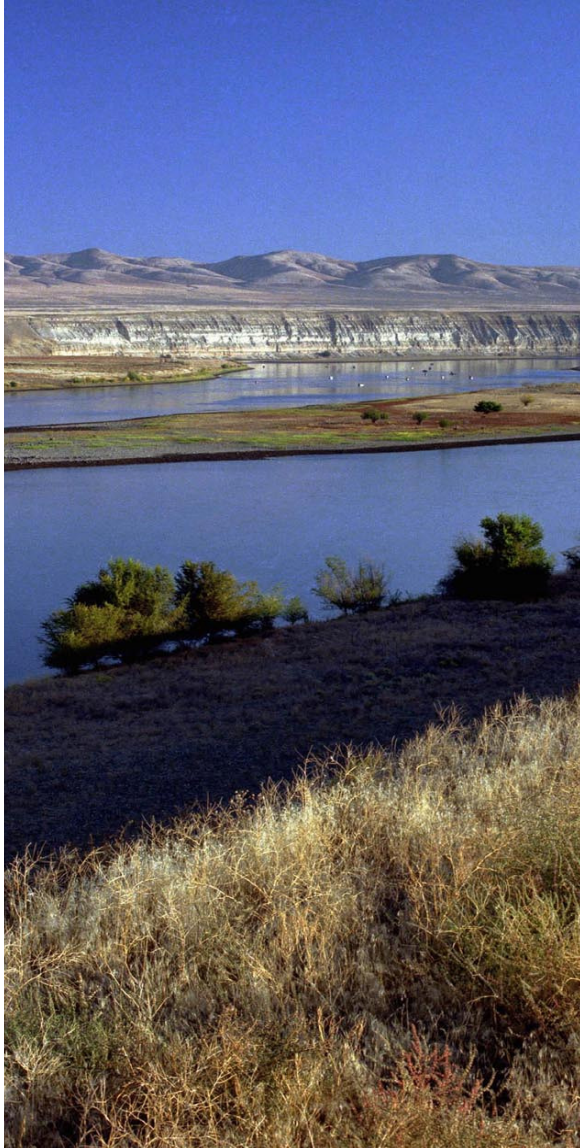


Office of River Protection



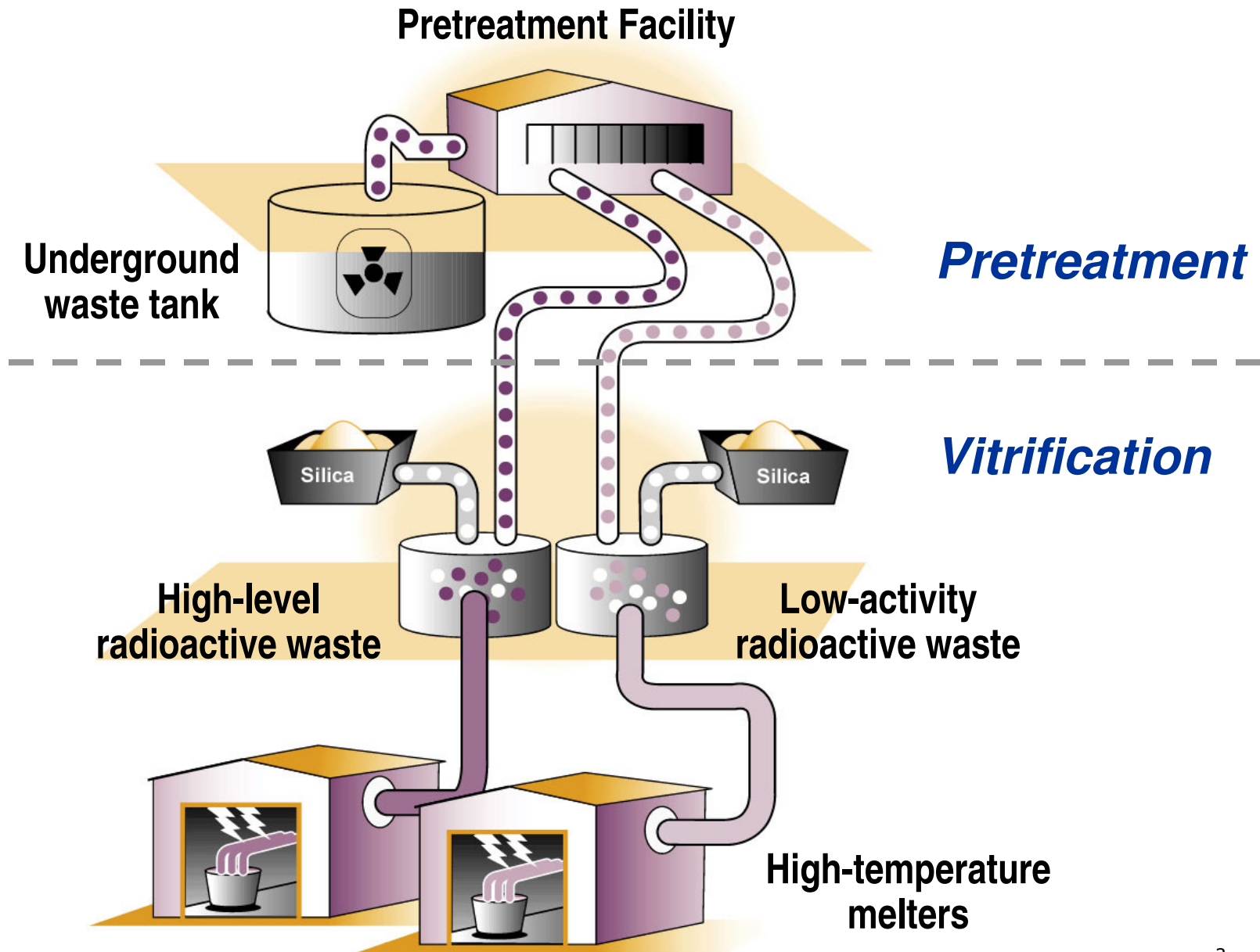
WTP Overview

***Environmental Management Advisory Board
National Academy of Public Administration***

Peter Furlong

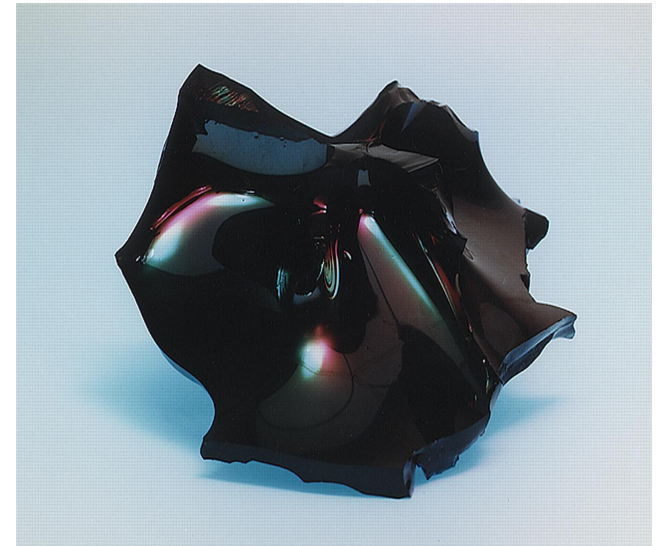
HLW and LAW Federal Project Director

Waste Treatment Process



The Solution: Immobilize the Waste in Glass

Vitrification offers the best solution for immobilizing Hanford's high-level radioactive waste and preventing an environmental catastrophe.



- *Proven technology* -- used overseas and at other DOE sites
- *Sturdy waste form* -- impervious to the environment
- *Expensive* -- requires large facilities constructed to nuclear standards

How is the Vitrified Waste Stored?

High Level Waste Canisters

- 2' X 14.5'
- 6,600 pounds of glass
- Temporarily stored in Hanford's Canister Storage Building until national repository built

Low Activity Waste Containers

- 4' X 7.5'
- 13,000 pounds of glass
- Stored at Hanford's Central Plateau



Current Status of the World's Largest Radiochemical Processing Plant



WTP Progress



Quantity	Engineering Released	Construction Installed	Planned Total	900MW Nuclear Power Plant
Concrete – CY	175,000	169,500	263,216	156,000
Structural Steel – TON	14,425	8,410	34,419	
Piping – LF	546,000	203,600	990,197	207,500
Conduit – LF	293,000	69,000	721,789	223,000
Cable Tray – LF	60,000	9,000	96,758	38,000
Cable – LF	375,000	192,000	4,343,267	
HVAC Duct – LB	2,123,000	465,530	4,022,000	

As of July 2006

Building Facts

	Pretreatment	Low Activity Waste Vit	High Level Waste Vit	Analytical Lab
Building Volume (ft ³)	13,900,000	6,500,000	8,600,000	2,592,000
Concrete (yd ³)	112,000	28,000	88,000	12,000
Structural Steel (tons)	16,240	6,020	9,500	1,700
Piping (ft)	1,660,000	99,000	160,000	33,000
Electrical Raceways (ft)	273,000	177,000	240,000	54,000
Electrical Cable (ft)	785,000	836,000	1,852,000	172,000
Craft Hours	7,581,000	1,989,000	4,997,000	553,000
Building Size (ft)	215 X 540 X 120	240 X 330 X 90	275 X 440X 95	320 X 180 X 45

Pretreatment Facility



Flowsheet

- Pretreatment (PT) Process Functions
 - Receive and Store Waste Feeds from DST System
 - Adjust Sodium Concentration of Waste and evaporate Plant Recycles
 - Separate and Wash Solids from Waste Feeds
 - Separate Cesium, Strontium and TRU Radionuclides from Waste Feeds
 - Blend the Separated Radionuclides for transfer to HLW Vitrification.
 - Concentrate the Treated LAW stream for transfer to LAW Vitrification.
 - Collect & Monitor Liquid Effluents

Flowsheet

- Pretreatment Process Equipment
 - Evaporators (2 Feed/Recycle + 1 Pre-treated LAW)
 - Forced-circulation, vacuum evaporation
 - 30 gpm evaporation rate each
 - Ultrafiltration (solid/liquid separation)
 - 0.1 μm sintered metal cross-flow filters
 - 17.7 gpm design throughput
 - Ion Exchange (4 column carousel)
 - Cs separation with organic elutable resin
 - 15 gpm design throughput

LAW Vitrification



Flowsheet

- Low Active Waste (LAW) Vitrification Process Functions
 - Receive, Hold, Adjust Pretreated Salt (Na) Waste
 - Sample for Process Control
 - Blend Melter Feed & Glass Formers
 - Sample Feed to Melter
 - Melter to Vitrify Feed
 - Container Handling & Storage
 - Melter Offgas Treatment

Flowsheet

- LAW Melter Type & Functionality
 - Ceramic-Lined
 - Joule Heated
 - Outer Steel Casing
 - Operating Temperature of 950 C to 1250 C

High Level Waste Facility



Flowsheet

- HLW Process Functions
 - Receive, Hold, Adjust Pretreated Waste
 - Sample for Process Control and Glass Qualification
 - Blend Melter Feed & Glass Formers
 - Sample Feed to Melter
 - Vitrify Feed
 - Canister Handling & Storage
 - Melter Offgas Treatment

Flowsheet

- High Level Waste (HLW) Melter Type & Functionality
 - Ceramic-Lined
 - Joule Heated
 - Outer Steel Casings
 - Converts Feed to Borosilicate Glass
 - Operating Temperature of 950 to 1250 Centigrade

Analytical Laboratory



Balance of Facilities

